

**PROCEEDINGS OF THE
MARINE TRANSPORTATION SYSTEM (MTS)
RESEARCH AND TECHNOLOGY
CONFERENCE**

**“MEETING THE NEEDS OF THE MTS
THROUGH RESEARCH AND TECHNOLOGY”**

6TH R&D COORDINATION CONFERENCE

**Sponsored by the
Interagency Committee for the MTS**

November 14-16, 2001

**National Academy of Sciences Building
Washington, DC**

**Hosted by the
United States Army Corps of Engineers
Washington, DC**

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¹ A copy of these proceedings may be found at <http://www.dot.gov/mts>. The web version also includes hyperlinks to additional materials consisting of session transcripts, available visual aid materials used during the presentations, abstracts, and other items of interest.

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PREFACE

The Marine Transportation System (MTS) is a complex and diverse system of waterways, ports and intermodal landside connections which carries 95% of all freight that enters or leaves the United States, and moves millions of passengers each year. The MTS includes over 25,000 miles of navigable channels, 238 locks at 192 river locations, and 3,700 marine terminals, which are connected to 174,000 miles of rail, 45,000 miles of interstate highway and 115,000 miles of other roadways. The MTS also includes thousands of marinas for recreational boaters, and 126,000 miles of navigable waterways whose environmental protection is critical to tourism, to recreational and commercial fishing, and to the health of those who live near and use these waterways, now more than half of the U.S. population.

Research and technology (R&T) has always played a key role in helping the MTS to meet its vision of being *the world's most technologically advanced, safe, secure, efficient, effective, accessible, globally competitive, dynamic and environmentally responsible system for moving goods and people*. However, with an expected doubling of trade in the next 20 years, the pressures on the U.S. MTS will be immense. The role of R&T in finding solutions to the myriad of problems that such a doubling of trade will create for this country will be even more important. Add on top of that the demands for increased Homeland Security since September 11th and the problems become even greater.

The Marine Transportation System Research and Technology Coordination Conference held at the National Academy of Sciences from November 14-16, 2001, in Washington, DC was the sixth biennial conference to focus on R&T in the MTS, but the first to be sponsored by the new Interagency Committee on the Marine Transportation System (ICMTS), which was established in 2000 by a Memorandum of Agreement among 18 Federal agencies (listed at the end of this Preface). The establishment of the ICMTS and its private sector counterpart, the MTS National Advisory Council (MTSNAC), was a result of recommendations made in a September 1999 Report to Congress entitled "An Assessment of the U.S. Marine Transportation System", which was based on the results of seven MTS Regional Listening Sessions held around the nation and a national conference held in Warrenton, Virginia in November 1998.

The theme of this year's conference was "Meeting the Needs of the Marine Transportation System Through Research and Technology." Thus the first of the three primary purposes of the conference was to identify new or changing research and technological needs of the MTS. The second purpose was to present recent progress in scientific and technological advances that could be applied to marine transportation and waterway management. The third was to foster new partnerships between federal, state, private, and academic institutions to improve the MTS, including management and protection of U.S. waterways.

The conference consisted of 6 plenary panels, 12 technical sessions, and a number of challenge speakers, in addition to exhibits. Original plans had one of the plenary panels devoted to the subject of Security, but after September 11th a second panel on that subject was added. Although both the Security panels, as well as the panels on Port Capacity, Intelligent Maritime Systems, Coastwise Transportation, and many of the technical

sessions, discussed some of the R&T needs of the MTS, the sixth panel on the final day of the conference was exclusively devoted to the that subject. More than 270 representatives from all parts of the MTS attended the Conference.

The 21 Federal agencies of the Interagency Committee on the Marine Transportation Committee are:

Department of Agriculture

Department of Commerce

National Oceanic and Atmospheric Administration

Bureau of Export Administration

Department of Defense

Military Sealift Command

National Imagery and Mapping Agency

U.S. Army Corps of Engineers

U.S. Navy

U.S. Transportation Command

Department of Interior

Minerals Management Service

Department of Transportation

Bureau of Transportation Statistics

Federal Highway Administration

Federal Railroad Administration

Federal Transit Administration

Maritime Administration

Office of Intermodalism

Office of Transportation Policy

Pipeline Safety Administration

St. Lawrence Seaway Development Corporation

U.S. Coast Guard

Department of Treasury

U.S. Customs Service

Environmental Protection Agency

ACKNOWLEDGEMENT

The Marine Transportation System (MTS) Research and Technology Coordination Conference was sponsored by the Interagency Committee on the Marine Transportation System (ICMTS), representing 21 federal agencies which deal with the MTS. The Research and Technology (R&T) Subcommittee of the ICMTS planned the program. The members of the R&T Subcommittee of the MTS National Advisory Council (MTSNAC) provided substantial assistance in finding key speakers and selecting important topics for discussion. The Conference was held at the National Academy of Sciences building in Washington, DC and the Transportation Research Board handled all the logistics for running the Conference. The U.S. Army Corps of Engineers (USACE) hosted this year's Conference and also compiled these published proceedings.

Many people deserve special recognition for their hard work in organizing the plenary panels. CAPT Jon Helmick (U.S. Merchant Marine Academy) organized the Intelligent Marine Transportation Systems panel. Paul Bea (Port Authority of New York and New Jersey) organized the Coastwise Transportation panel. Joedy Cambridge (Transportation Research Board, TRB) organized the Port Capacity panel. CAPT Tony Regalbuto (U.S. Coast Guard) and Bruce Parker (NOAA) organized the two Security panels. Bruce Parker (NOAA) also organized the MTS User Needs Panel. Although some of the technical sessions were organized from papers submitted to a "Call for Papers" a number of these sessions were also specially organized. Jim McCarville (Port of Pittsburgh) organized the Container On Barge session. Bob Bouchard and Richard Walker (Maritime Administration) organized the Intermodal Freight Network System session, as well as the ITS Technology and Information session. Richard Lolich (Maritime Administration) organized the Ferries session. Craig Vogt (Environmental Protection Agency) and Dorn Carlson (NOAA) organized the Ballast Water Treatment Technologies session. William McAnally (USACE) organized the two Regional Sediment Management sessions. Sandra Knight (USACE) organized the Level of Service session. Philip Thorpe (USACE) organized the Future Fleet Predictive Capability session. Bruce Parker (NOAA) coordinated the entire program and chaired the R&T Subcommittee of the ICMTS during the planning and operation of the Conference.

In addition, several people provided frequent and important advice on potential speakers and topics, especially Jean Godwin (American Association of Port Authorities), Joedy Cambridge (TRB), Margie Hegy (U.S. Coast Guard), Hank Marcus (Massachusetts Institute of Technology), and Bernie Groseclose (Port Authority of South Carolina), the last two serving as Co-Chairs of the R&T Subcommittee for MTSNAC. All the members of the R&T Subcommittee of the ICMTS, who are listed in Appendix C, played an important role in planning the program and finding speakers.

Special thanks are due to all of the above people, as well as to others who chaired or served as coordinators for technical sessions (whose names can be found in the Program Agenda), as well as the many speakers and panelists. Special thanks are also due to the Keynote, Challenge, and Dinner Speakers who greatly added to the Conference Program. These included: Brigadier General Robert Griffin (USACE), Admiral James Loy (U.S. Coast Guard), Captain Michael Watson (American Pilots Association), John Vickerman

(TranSystems Corporation), Ashish Sen (Bureau of Transportation Statistics), Harry Caldwell (Federal Highway Administration), and Carl Bentzel (Senior Council, Subcommittee on Surface Transportation and Merchant Marine, Committee on Commerce, Science, and Transportation, U.S. Senate).

Last, and most important, a very special thanks goes to CPT Amanda Greig (USACE) who put in a tremendous effort in producing these proceedings for the Conference. Transcripts for the proceedings produced from tapes at the Conference were overseen and edited by Joedy Cambridge (TRB), prior to being sent by Captain Greig to the speakers for review. Members of the R&T Subcommittee of the ICMTS provided overall review, with special efforts by Andrew Silver (U.S. Navy, and new Chair of the R&T Subcommittee) and Sandra Knight (USACE, and new Vice-Chair of the R&T Subcommittee). As with the previous R&T Conference, Joedy Cambridge (TRB) played a critical role in overseeing the TRB logistical support for the Conference at the NAS building.

More complete affiliations and addresses for all those mentioned above can be found in Appendix D.